Crossing Paths

WITH WILDLIFE IN WASHINGTON TOWNS AND CITIES

Fall 2003

Wildlife viewing tourism workshop kicks off planning

by Dr. Jeff Koenings, WDFW Director

Thanks to Backyard Wildlife Sanctuary manager and state Senator Ken Jacobsen of Seattle, who sponsored Senate Bill 5011 with the help of Senators Shirley Winsley of Fircrest and Jeanne Kohl-Welles of Seattle, Washington conducted its first wildlife tourism workshop this September.

About 150 people, including state and local government leaders, gathered in Olympia to explore ways to expand wildlife viewing tourism in Washington's rural communities.

We at the Washington Department of Fish and Wildlife (WDFW) co-hosted the workshop with the Department of Community, Trade and Economic Development (CTED) to start developing a statewide strategic plan, as requested by legislators, for boosting wildlife viewing tourism to provide sustainable economic development in rural areas and maintain the state's diverse wildlife resources.

As I've relayed to you before, about 2.5 million wildlife viewers spent nearly $1 billion in 2001 in Washington state on

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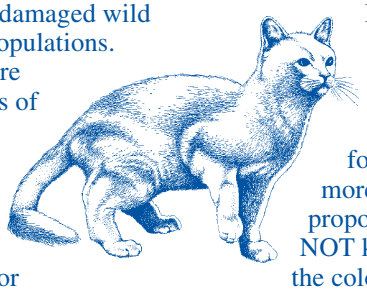
Feral cats are NOT wildlife in need of support

Wild birds and free-ranging cats are not a good mix.

As a Backyard Wildlife Sanctuary manager, you most likely keep your cat confined and talk to cat-owning neighbors about doing the same.

But what about homeless cats?

"Feral" cats, which are usually strays that are untamed or wild, are estimated to range from 60 to 100 million throughout the United States. They are NOT wildlife. Feral cats are non-native predators that can, and have, seriously damaged wild bird and other wildlife populations.



While domestic cats are solitary animals, colonies of feral cats often form around food sources like bird feeding stations, garbage dumps, or places where people deliberately leave food for them. In fact, many colonies of feral cats are supported by well-meaning but misinformed advocates of what's become known as "TNR" management: Trap, Neuter, Release.

This wrong solution to a tragic problem works this way: Feral cats are trapped and taken to a clinic or veterinarian for disease testing. Those that are seriously ill or test positive for contagious diseases are usually euthanized, otherwise they are simply spayed or neutered. Then the feral cats are released back to where they were trapped and where they are supplied with food and water daily.

The theory behind TNR programs, which are funded by both private and public entities across the country, is eventual reduction of feral cat colonies. But sadly, such claims are not substantiated.

Cat colonies often serve as dumping grounds for other unwanted cats. The food provided usually attracts more cats. Contrary to TNR proponent beliefs, colony cats do NOT keep other cats from joining the colony. As time goes on, some colony cats become too wary to be caught, so rarely are all spayed or neutered. With females capable of producing up to three litters of four to six kittens each every year, it doesn't take long to grow a feral cat colony.

Well-fed cats, either feral or domestic, become "super-predators" of birds and other wildlife. The need to eat and the instinct to hunt can and do function separately. Any cat owner can attest to this fact with stories of "gift birds" laid at their feet by feline companions.

There is extensive documentation that free-roaming cats are prolific and efficient predators, even if, and especially when, they are regularly fed. Almost one-fifth of all injured wildlife brought to Washington's wildlife rehabilitators across the state was harmed by cats.

Some TNR advocates believe that feral cat colonies are "wildlife" themselves.

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Crossing Paths is a twice-yearly newsletter for Washington residents enrolled in the Backyard Wildlife Sanctuary Program.

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Washington Department of FISH and WILDLIFE

Living with Washington's Wildlife: Great Blue Heron

(Editor's note: If you've got a pond in your Backyard Wildlife Sanctuary, or simply live near a body of water, chances are you're occasionally visited by a great blue heron. Depending on your outlook, heron visits can be a joy or a frustration. We'll take a look at this bird in an excerpt from the "Living With Washington's Wildlife" series being compiled by WDFW's Seattle-area urban wildlife biologist Russell Link. This series of factsheets should be available soon at WDFW regional offices and on the website, and will be part of a new book, "Living With Wildlife in the Pacific Northwest" due out next year.)

The great blue heron (*Ardea herodias)* is a large (four-foot-tall), grayish-blue wading bird with a long bill, neck, and legs. In flight, the great blue heron can be recognized by its long neck folded back on the shoulders, its long trailing legs, and its slow, deep wing beats. Adults can be recognized by the presence of a black plume. Males and females are identical in appearance.

Great blue herons are found year-round throughout Washington. They are at home in both salt and fresh water and are seen on lakes, ponds, rivers, marshes, mudflats, irrigation ditches, and in farm fields and meadows.

Food and Feeding Habits

- Herons feed on a variety of prey, including fish, frogs, young birds and bird eggs, snakes, and insects, as well as mice, moles, gophers, and other small mammals.
- They are "stand-and-wait" predators that remain motionless for long periods of time, waiting for prey to venture within striking range of their long, stabbing bills.
- Herons feed during the day and at night in lighted areas, generally within three miles of their nesting colony. They tend to be solitary feeders, but where the food supply is abundant, many can be found feeding together.
- Where water freezes, heron populations concentrate along major open-water rivers where food is available, or they hunt rodents on land.

Nest Sites and Nests

- Great blue herons nest in colonies, also called "rookeries," which may contain a few or hundreds of nests.
- Rookeries are usually in isolated spots away from disturbance and near suitable feeding areas, although some are in large public parks and greenbelts.
- Herons nest in deciduous or evergreen trees and snags, usually near the top of the tallest ones on vertical branches, often on islands or in trees with water around the base,

presumably to reduce the risk of predation by mammals.
- Where trees are absent, nests may be located on large shrubs, cliffs, and artificial structures.
- Nests are 25 to 40 inches in diameter and 12 inches or more thick, constructed from branches and twigs.
- Rookeries may be used for decades; however, herons will relocate their colonies in response to increased predation on eggs and young, declines in food availability, human disturbance, and when nest trees fall.

Reproduction

- Adult herons can arrive on the nests as early as February. Nest building and repair usually begins in March.
- Three to five pale, greenish-blue eggs are incubated for 25 to 29 days by both sexes.
- Young birds first fly at around 60 days of age and leave the nest at 65 to 90 days, at which time they are similar in size to adults.
- Great blue herons have one brood per year, although they may re-nest if their first clutch fails.

Mortality and Longevity

- Adult great blue herons don't have many predators. Bobcats and coyotes occasionally kill adults feeding at ground level.
- Mortality of the young is high: crows, ravens, gulls, eagles, and raccoons prey upon both the eggs and young. Heavy rains and cold weather at hatching also take a toll.
- Six to eight years of age is the normal life span.

Great blue herons are great birds for the beginning birder to observe, partly because of their size. In urban areas, herons have acclimated to people so you can get a close view of their hunting behavior. A pair of binoculars or a spotting scope will allow for exceptionally close views of their black plumes and yellow eyes.

The nesting behavior of great blue herons is not often witnessed because, with some urban exceptions, they nest in colonies in fairly isolated areas. Nesting herons should be left alone, and area regulations and closures to protect colonies should be followed. Several studies have shown that human disturbance during the breeding season can cause adult herons to abandon the entire colony.

Great blue herons often congregate at mudflats and eelgrass beds during low tides from June to December, where they feed on small fish. Here you may have the opportunity to view many herons at once.

Tracks: Great blue heron tracks are easily found in the mud or sand in a feeding site. Their six-inch-long tracks show four toes and the webbing may or may not appear, depending on the hardness of the surface.

Droppings and pellets: Great blue heron droppings are semi-liquid and

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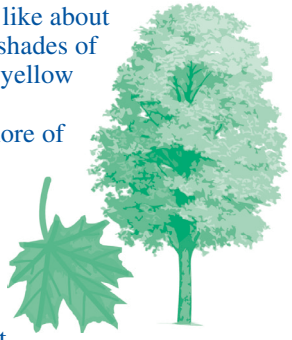
Like those fall leaf colors? Plant deciduous trees now!



What's not to like about all the beautiful shades of red, orange, and yellow of fall leaves?

If you want more of those autumn colors in your yard next fall, plant deciduous trees now.

Fall is the best time to plant most trees and shrubs, since the relocation is easier on dormant root systems that will then get a jump start on growth next spring.

There are many colorful species native to Washington that are also excellent for wildlife.

Maples come to mind for many fall red leaf fans. We recommend three natives that benefit seed-eating grosbeaks, woodpeckers, nuthatches, finches, quail, and grouse, wood-eating deer, mountain beaver and beaver, and nectar-eating bees:

- Vine maple *(Acer circinatum)*, shade-tolerant understory shrub or small tree
- Douglas maple *(Acer glabrum* var. *douglassii),* more drought-tolerant small tree
- Big-leaf maple *(Acer macrophyllum)*, large fast-growing tree suitable for large landscapes

Birches turn nicely yellow in the fall and in addition to seeds, they provide lots of insects for kinglets, sapsuckers, warblers and chickadees, plus leaves for mourning cloak and swallowtail butterfly larvae. Keep both these natives wet and in full sun:

- Water birch *(Betula occidentalis),* hardy clump-grower
- Paper birch *(Betula papyrifera*), taller, multi-stemmed tree

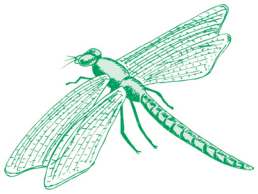
Oaks often provide warm oranges and browns and of course their acorns are consumed by a wide variety of birds and mammals. If you've got the space and patience for growth, try:

- Oregon white oak *(Quercus garryana),* our only native
- California black oak *(Quercus kelloggii)*

For gorgeous golden color, there's nothing like Quaking aspen *(Populus tremuloides)*. Its catkins are eaten by grouse, pheasants, and siskins, winter buds by orioles and purple finches, leaves, twigs and wood by everything from deer to rabbits. Aspen's naturally thicket-forming habit makes it most suitable for larger landscapes.

Check out your local tree nursery's selection of many other deciduous trees and get planting before freeze-up.

Migration isn't just for birds



Fall is a favorite season for many bird-watchers because so many different species migrate through our yards at this time of year.

But some mammals like bats and whales, butterflies like monarchs and admirals, and even dragonflies migrate in the fall, too.

Dragonflies? Yes, a small number of dragonfly species move in substantial numbers now. Dragonfly watching is becoming more popular thanks to more field guides on the market to help you tell them apart.

One species to look for in Washington is the **Common Green Darner** *(Anax junius).*

It's one of the biggest dragonflies, at about three inches in body length with a wingspan over four inches. Its thorax is green, abdomen blue to purplish gray, and its clear wings have pale yellowish areas towards the tips that turn amber as it ages.

Green darners are usually found near ponds or slow streams where they feed on midges, mosquitoes, and other flying insects. They seldom perch. In late summer and early fall you might see pairs of them flying in tandem over open water. Many of them migrate south out of Washington in October.

On Geese and friends . . .

When you see geese flying in a "V" formation, you might be interested in knowing what facts scientists have discovered about why they fly that way, and the truths they reflect in our relationships.

Fact: As each bird flaps its wings, it creates uplift for the bird immediately following. By flying in a "V" formation, the whole flock adds at least 91 percent greater flying range than if each bird flew on its own.

Truth: People who share a common direction and sense of communication get where they are going quicker and easier because they are traveling on the trust of one another.

Fact: Whenever a goose falls out of formation, it suddenly feels the drag and resistance of trying to go it alone and quickly gets back into formation to take advantage of the lifting power of the bird immediately in front of it.

Truth: There is strength and power and safety in numbers when traveling in the same direction with those with whom we have a common goal.

Fact: When the lead goose gets tired, it rotates back in to wing and another goose flies point.

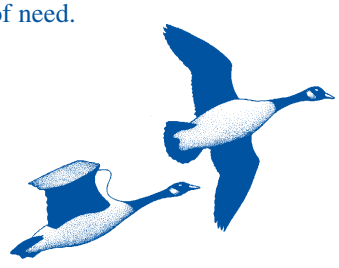
Truth: It pays to take turns doing hard jobs.

Fact: The geese honk from behind to encourage those up front to keep up their speed.

Truth: We all need to be remembered with active support and praise.

Fact: When a goose gets sick or is wounded and falls out, two geese fall out of formation and follow it down to help and protect it. They stay with it until the crisis resolves, and then they launch out on their own or with another formation to catch up with their group.

Truth: We must stand by each other in time of need.



Feral cats *(continued from page 1)*

Some groups have even fought for (and so far lost) accommodations for feral cats on wildlife refuges and other public lands.

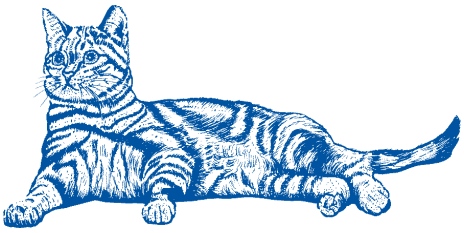
In addition to their threats to wildlife, feral cat colonies pose human health risks. Even TNR-managed colonies can spread disease such as ringworm, toxoplasmosis, cat scratch fever, and rabies, since every cat is not captured regularly for health care. Feeding stations attract raccoons and skunks, the two most common wildlife carriers of rabies, along with the cats, which are the most commonly reported rabid domestic animal.

Free-roaming cats of any kind are their own worst enemy, too. They usually have short, miserable lives, due to collisions with motor vehicles, attacks by other domestic and wild animals, accidental poisoning or trapping, and parasites and diseases.

The Humane Society of the United States reports that the expected life span of an indoor cat is at least triple that of cats that spend their lives outdoors.

TNR management of feral cats is clearly not in the best interests of anyone, and it often overwhelms the ability of well-meaning people who genuinely want to help animals. It also undermines efforts of responsible pet owners who keep their cats indoors.

The National Association of State Public Health Veterinarians, American Association of Wildlife Veterinarians, American Bird Conservancy, American Ornithologists' Union, and Cooper Ornithological Society oppose TNR practices. In addition, the Humane Society of the United States, People for the Ethical Treatment of Animals, and



American Society for the Prevention of Cruelty to Animals have expressed concerns about this practice.

So what should be done to protect wildlife and treat all animals humanely?

First and foremost, spay or neuter your own cats and help promote community-wide spay/neuter information campaigns and low or no-cost spay/neuter clinics. The fewer kittens produced and possibly abandoned, the smaller feral cat colonies will be.

Second, keep your cat indoors. Spread the word to other cat owners that indoor cats live longer lives and avoid harassing wildlife. Unspayed or non-neutered cats kept indoors also won't add to the feral cat population explosion.

Help inform and educate others that practicing TNR is not the solution for feral cat management. Initiate or support local ordinances that prohibit cat abandonment and feral cat feeding. Humanely trap and remove feral cats, especially in public areas that provide habitat for wildlife, and take them to an animal shelter for possible adoption or humane euthanasia.

For more information contact the American Bird Conservancy's "Cats Indoors! The Campaign for Safer Birds and Cats" at 1834 Jefferson Place, NW, Washington, DC 20036 (www.abcbirds.org).

Wildlife Viewing Tourism Workshop

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various goods and services, according to a recently released federal survey. The survey placed Washington seventh nationally in total wildlife viewing spending, just behind states such as California, Florida and New York.

Wildlife viewers open their pocketbooks and let their discretionary income flow on restaurant meals and motel rooms, gasoline and galoshes, boats and binoculars, rain gear and rafts—you name it. And you know it, because as Backyard Wildlife Sanctuary managers you spend on landscaping plants, nest boxes, bird feeders, and feed throughout the year to view wildlife on your own property.

There's no question in my mind that our rural communities stand to gain even more in the years ahead from wildlife viewing-related tourism.

Consider that in 1969 there was only one major wildlife viewing festival in Washington state. Today there are at least a dozen festivals, nine of which have been launched since 1990 in communities as diverse as Othello and Ocean Shores, Marblemount and Walla Walla.

Our Watchable Wildlife program coordinators Mike O'Malley and Chuck Gibilisco are working with George Sharp and Joan Stilz from CTED and Nina Carter from Audubon Washington as part of the planning team for development of the statewide strategic plan. A draft of the plan is expected to be presented at a state-sponsored Tourism Forum in Seattle in November.

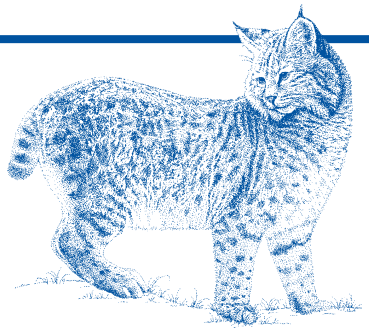
I invite you, as active wildlife viewers, to comment on the draft plan, which will be available at the forum and posted on our website (www.wa.gov/wdfw).

Go to the front of the yard!

Backyard Wildlife Sanctuary manager Joyce Meyer of King County was ahead of us when we encouraged in the last edition of this newsletter (Spring 2003) the use of front yards for wildlife sanctuaries.

"I had 2000 square feet of front lawn removed last year and had Livingearth Landscapes of Redmond re-do my front with a walking path, some native plants, and mostly animal and bird-loving plants," she wrote. "My existing rhodies were either left or incorporated. I just love the new area and I like to say that the deer trim, water and fertilize my yard now."

Joyce also reported having a long-tailed weasel, barred owl, and even a bobcat in her yard! We say "go to the front of the yard" with those kinds of results!



The Great Washington State Birding Trail

The first map of the Great Washington Birding Trail, the **Cascade Loop**, rolled off the presses last fall. The full-color, foldout map features original artwork of birds and descriptions of 68 sites from Edmonds to the Skagit, up to the Canadian border, across the mountains to Lake Chelan and back through Leavenworth. The first of six planned routes, the Cascades Loop features 225 of Washington's 365 bird species.

Birding Trail maps are actually driving trips with stops at special places where birds are most likely to be seen. Each stop describes the habitat, what birds are there in what season, where to look, and how to get from a main road to the location.

With 71 million people in America describing themselves as interested in bird watching, Birding Trails in other states have become big business. The Trails and their birds attract visitors to primarily rural locations, which spurs economic development and gives local residents increased incentive to safeguard the natural areas around their communities and region.

The **Coulee Corridor** route is under development, and following that, a loop around the **Olympic Peninsula** is planned. You can order over the phone by calling 1-866-WA-BIRDS (1-866-922-4737) or you can†order the map at http://wa.audubon.org/new/audubon/default.cfm?pageID=136

Winter bird surveys discontinued

Ten years of the Washington Department of Fish and Wildlife (WDFW) winter backyard bird surveys have come to an end. Due to budget cuts, the survey will not be continued. WDFW survey coordinator Patricia Thompson thanks all Backyard Wildlife Sanctuary managers for their participation in this effort to learn more about Washington's wintering bird populations. A wrap-up report will be sent out to all participants later this year or as soon as possible.

Rare bats saga continues with radio telemetry

The very rare bat colony in an old log cabin north of Spokane that is featured on WDFW's website "Bat Cam" (http://www.wa.gov/wdfw/wildwatch/batcam/index.html) continues to be monitored by Eastern Washington University graduate students, this year with the help of radio telemetry equipment.

The Townsend's big-eared bat, *Corynorhinus townsendii*, is a candidate for state listing as a threatened or endangered species and is considered one of the rarest mammals in the northwest. They have low populations and low annual natality rates, probably because they have very specific hibernacula requirements involving caves, mines, and buildings and are very sensitive to human disturbance. Of the twelve maternity roosts known in Washington, only two are in the eastern part of the state, both in man-made structures.

Like last year, the first 40 or so of these migratory bats arrived back at the cabin in early April. Also like last year, bat presence at the roost was sporadic throughout the rest of April, May, and June.

But their overall presence and numbers were consistently lower than last year. Only five bats were observed in late May, and with the exception of one day when 22 bats were present, after mid June there were only two or four bats.

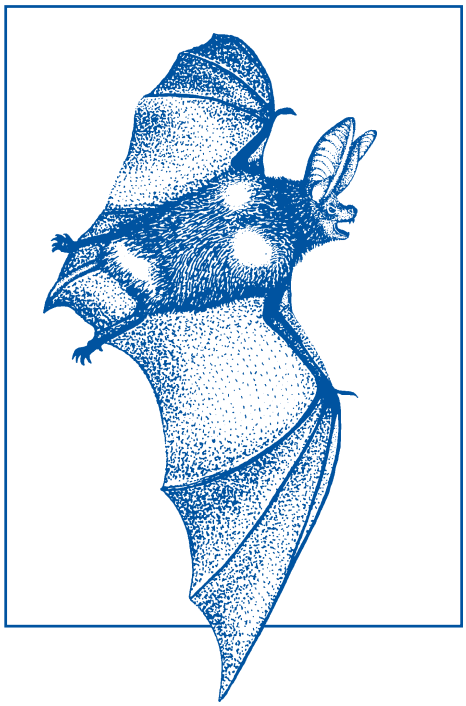
Researchers began to wonder if the bats had abandoned this roost. In an effort to locate where the bats were roosting, three lactating bats were captured on July 2 and radio telemetry transmitters were placed on two of them.

The radioed bats were tracked to two different locations, both within three miles of the original location. One roost was located in the attic of an abandoned log cabin similar to the original roost (but painted a gaudy red) where 175 bats were present. The other was located, along with about 45 bats, in the crawl space of a building at a very active youth summer camp.† Both colonies had young.

On July 11 both radioed bats were at their respective new locations and the original cabin roost (featured on BatCam) had 30 bats. On July 13, one radioed bat was at the "red" cabin and the other was found in the original cabin along with 140 bats.

By August the original cabin was hosting up to 300 bats, including young of the year. By early September the bats were beginning to disperse, with around 150 left. At the same time, the newly discovered red roost had around 25 bats.

This movement between roosts is still a mystery so research will continue next year when the bats hopefully return again.



Great Blue Herons (continued from page 2)

mostly white. The ground beneath nests can become coated with droppings. Undigested material is coughed up as 2 to 3 inches pellets, containing signs of fish, rodents, and other prey.

Calls: The normal call of a great blue heron is a deep, hoarse "*fraaaahnk"* or "*braak"*. In aggressive situations or when frightened, the call is a short, harsh "*frank frank frank taaaaaw"*. Herons call in flight and on the ground, during the day and at night.

An adult arriving at the rookery usually gives a dull, guttural cry. The young can cry loudly and constantly when hungry and about to be fed.

Tips for Attracting Herons

A pond full of small fish makes a wonderful heron feeder. Keep the pond stocked with cheap feeder goldfish, give the heron a place to stalk them, and enjoy the show. To give fish a place to hide, one or two areas can be kept as hunting spots for herons and the other areas can be heavily planted to block access into the pond and provide cover for the fish.

To help preserve heron habitat:

- Preserve shoreline trees and any tall groups of trees by the water.
- Protect eelgrass beds, which are great habitat for herring — a major food source.
- Protect wetlands.
- Keep pets, especially dogs, under control and away from great blue herons and rookeries.
- While boating or visiting the beach, give herons and heron rookeries plenty of space.
- Minimize development near heron rookeries.

Preventing Conflicts

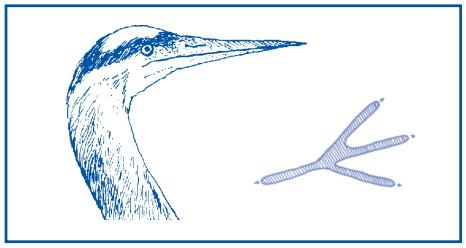
Many people are willing to lose some inexpensive feeder fish to great blue herons in exchange for the opportunity see one of these magnificent birds. However, some homeowners have expensive fish in their pond or have bonded to the ones they placed there and watched grow. Others object to the mess herons sometimes leave behind.

Predation can occur at any time of the year, although the problem is greatest in spring and early summer, when the birds feed their young. Each day, an adult heron needs about 13 ounces of food, which is equivalent to three six-inch koi or 10 two-inch goldfish. Herons take twice this amount when feeding their young.

Herons usually visit ponds when everything is quiet, usually early in the morning or in the evening. Once they've found an easy source of food, such as colorful fish in a shallow pond, they will return on several consecutive days until most of the fish have been taken.

There are several ways of reducing heron attacks on your pond fish. All are most successful when in place before the birds discover the easy food source.

(Keep in mind that all heron species, nests, and eggs are protected year-round from persecution, hunting, and harassment under federal and state law. A federal permit may be obtained from the U.S. Fish and Wildlife Service to use lethal means to control herons when extreme damage is occurring on private property. Such a permit is only granted after all other non-lethal control techniques have proven to be unsuccessful.)



Create an overhead barrier: Suspend a taut net (with a mesh size of three inches or less) above the pond surface. Make sure the net is at least two feet above the pond and cannot fall into the pond when a heron lands on the net and tries to spear the fish through it. While this may not be the best looking solution, it is by far the most effective deterrent for most herons.

Exclude herons from large ponds by suspending parallel strands of steel wire (28-gauge) or monofilament line (50-pound test) over the pond. Wire or monofilament lines should be spaced no more than 12 inches apart. Wire or line barriers should be installed at least two feet above an area needing protection. Prevent herons from entering under the barrier by installing a two-foot high wire fence or a perimeter barrier as described below.

These barriers need to be checked daily for maintenance and entangled birds. Brightly colored top nets are more visible to birds and reduce entanglement problems.

Create a perimeter barrier: Herons will not normally land directly in the pond, as they will scare the fish. Instead, they land nearby and slowly walk toward the water. Install two strands of electrified wire, eight and 18 inches off the ground, and back from the water's edge to prevent the heron from leaning over the barrier to catch the fish. (Strong fishing line may be tried at first, but herons are likely to go under or over it.)

The wires can be hooked up to a switch for discretionary use; when you want to work near the wires, turn the system off. Be sure to keep the wires away from shoreline plants that can short the power out.

For safety, tie a sign, cloth, or other material on the wire for visibility.

Alternatively, or in addition to a perimeter fence, secure a two-foot wide strip of chicken wire flat around the inside of the pond edge and just under the water in areas where a heron is entering the water. (Cut the wire as needed to match the curvature of the pond.) Herons will have difficulty reaching over the wire, and will tend to not stand on it because of its instability. To camouflage and extend the life of the wire, paint it with dark-colored automobile undercoat paint or other rustproof paint.

Provide hiding places for fish: Plant mat-forming aquatic plants, such as water lilies, for protection during the growing season. For year-round protection, construct hiding places on the bottom of the pond using cinder blocks, ceramic drain tile, wire baskets, or upside-down plastic crates held in place with heavy rocks. Deepen areas of the pond to at least three feet — too deep for the heron to reach.

Preventative pond and planting design: When designing a pond it is possible to make life difficult for herons. Dense growths of tall marginal plants or shrubs around the pond will limit their access to the water. Ensuring the pond side is steep and the water is eight to 12 inches below the edge of the pond will

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Habitat fragmentation may help spread WNV

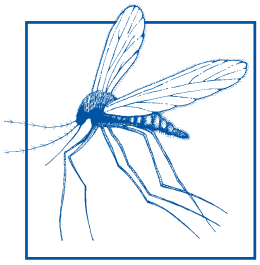
(Excerpted from an article by Laura Spinney)

Researchers have found that the mosquitoes that transmit West Nile Virus (WNV) to birds are quite particular about the species they feed on. One of their favorites, the brown-headed cowbird, happens to be increasing in numbers and pushing westwards through the US as a result of the fragmentation of its habitat by humans, showing how we might be driving new epidemics towards ourselves.

The primary hosts of WNV are birds. Mosquitoes that normally feed only on birds maintain a cycle of infection within them, and the virus only breaks out of that cycle to infect other species when "bridge vectors" - mosquitoes that bite both humans and birds - come into contact with an infected bird.

For that reason, the degree of contact between bird and mosquito – or horse and mosquito in the case of another, far more vicious neurological disease called Eastern Equine Encephalomyelitis (EEE) - is thought to be a major factor determining whether the virus crosses the species barrier. When contact is high, the virus amplifies itself more quickly and there is a higher chance that the bridge vector will come into contact with it.

To investigate how the degree of contact affects viral levels, and hence the risk of infection for humans, Thomas Unnasch of the University of Alabama at Birmingham and colleagues analyzed the stomach contents of bird-biting mosquitoes in three states: New Jersey, New York and Tennessee. They used a reverse transcriptase-polymerase chain reaction to detect the presence of WNV, and another sensitive assay to determine the species of origin of the mosquitoes' blood meals.



At all the test sites, they found that of the 24 bird species the mosquitoes fed on, three accounted for more than 50 percent of the blood they had ingested. Of these, the most notable was the brown-headed cowbird.

Similarly, in Alabama's Tuskagee National Forest, which saw an epidemic of EEE in 2001, the first year of the study, the mosquitoes favored two species: the American robin and the brown-headed cowbird, with the cowbird accounting for more than 40 percent of their blood meals.

The American crow seemed not to be to the mosquitoes' liking at any of the sites, although American crows are regarded as "sentinels" for the arrival of WNV because they are highly susceptible to it and die off quickly once infected.

In both the EEE and WNV studies, the researchers were surprised to find that the birds the mosquitoes preferred to bite were not endemic to the swamps they themselves inhabited. The birds' usual habitats were grasslands or higher altitude ecosystems.

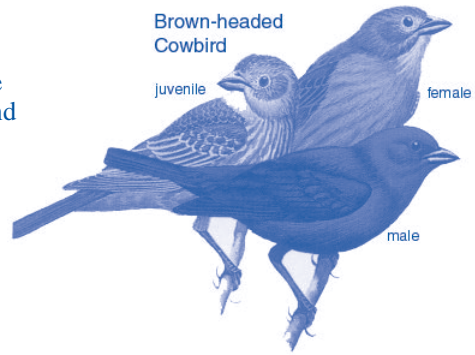
According to Unnasch, that suggests the mosquitoes' habitat could be larger than was previously thought, and they might forage outside swamp areas before returning to them to digest their meals and lay their eggs. At the same time, forest clearance could be enabling grassland-dwelling cowbirds to stray closer to mosquito-ridden areas. "What we are seeing is a consistent pattern of these arboviral vectors targeting just a very few species," he says.

His team also found that in July and August a higher proportion of the mosquitoes' blood meals came from hosts other than birds. Before that July drop-off, however, birds were their main targets.

Unnasch thinks that the mosquitoes might be zeroing in on fledglings of certain species. He suggests that young birds are a dead-end population. Because they are virally naive, they die quickly and provide no reservoir for transmission to other birds or humans.

However, fledglings abound early in the season and transmission generally peaks in late summer, he says, so more research is needed to explain the delayed, late summer peak.

"This to me is really interesting because of the increases we have seen in brown-headed cowbirds with the fragmentation of the landscape," said Sharon Collinge of the Department of Environmental, Population and Organismic Biology and the Environmental Studies Program at the University of Colorado, Boulder. "They've moved westwards and they tend to forage more around forest edges."



Great Blue Herons *(continued from page 6)*

also help because the heron will not be able to reach the fish.

Scare tactics: Although law protects these birds, you may harass them without obtaining a permit as long as the birds are not nesting or touched by a person or an "agent" of a person (e.g., a trained dog). There are a number of commercial devices available that work in different ways. Some work on a "tripwire" basis, producing a loud noise and, in some cases, a visual deterrent which scares the heron away. The "Scarecrow"" detects the presence of the heron using infrared detection, and scares it away by spraying a high-pressure jet of water. The effectiveness of scare devices is often short term as birds may quickly become accustomed to them.

Plastic herons: Artificial plastic herons are very popular. Their success is based on the principle that herons are territorial and will not feed close to another heron. Unfortunately, this is not completely effective at any time, especially in late winter and early spring when the herons are searching for a mate. In this case, it may actually attract herons to your pond.

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